

CLAIMS

1. A method of inducing a stem cell to undergo osteogenic differentiation comprising:
 - (a) providing a stem cell; and
 - 5 (b) contacting said stem cell with at least one factor produced by a metastatic prostate cancer cell under conditions supporting growth of said stem cell,

whereby said factor induces said stem cell to become an osteoprogenitor cell, a preosteoblast, or an osteoblast.
- 10 2. The method of claim 1, wherein said stem cell is a mesenchymal stem cell, a hematopoietic stem cell, an embryonic stem cell, a tissue stem cell, or an embryonic carcinoma cell.
- 15 3. The method of claim 1, wherein said factor is derived from a metastatic prostate cancer cell conditioned medium.
4. The method of claim 3, wherein said stem cell is contacted with metastatic prostate cell condition medium.
- 15 5. The method of claim 1, wherein said osteoblast further produces tissue-like aggregates.
6. The method of claim 5, wherein said tissue-like aggregates form bone matrix.
7. The method of claim 1, wherein said stem cell is located in a subject.
- 20 8. The method of claim 7, wherein said subject suffers from bone loss, bone damage, or bone destructive disease.
9. The method of claim 8, wherein said bone destructive disease is osteoporosis, secondary osteoporosis, osteolytic bone cancer, Paget's Disease, endocrinological disorders, hypophosphatemia, hypocalcemia, renal osteodystrophy, hypoparathyroidism, hyperparathyroidism, or osteomalacia.
- 25 10. The method of claim 1, further comprising contacting said stem cell with an additional osteogenic factor.

11. A composition comprising medium condition by growth of a metastatic prostate cancer cell therein.
12. A protein factor obtained from metastatic prostate cancer cell conditioned medium that induces stems cells to differentiate into osteoblasts.
- 5 13. A method of obtaining a protein factor produced by a metastatic prostate cancer cell, wherein said factor induces stems cells to differentiate into osteoblasts, comprising:
 - (a) obtaining metastatic prostate cancer cell conditioned medium; and
 - (b) separating protein and non-protein components of said medium.
14. A heat-labile protein factor obtained from a metastatic prostate cancer cell conditioned 10 medium that induces *ex vivo* bone formation by osteoblasts.
15. A method of obtaining a protein factor produced by a metastatic prostate cancer cell, wherein said factor induces *ex vivo* bone formation by osteoblasts, comprising:
 - (a) obtaining metastatic prostate cancer cell conditioned medium; and
 - (b) separating protein and non-protein components of said medium.
- 15 16. A method of inducing an osteoblast to form bone comprising:
 - (a) providing an osteoblast; and
 - (b) contacting said stem cell with at least one factor produced by a metastatic prostate cancer cell under conditions supporting growth of said osteoblast,
whereby said osteoblast produces bone.
- 20 17. The method of claim 1, wherein said factor is derived from a metastatic prostate cancer cell conditioned medium.
18. The method of claim 17, wherein said osteoblast is contacted with metastatic prostate cell condition medium.
19. The method of claim 17, wherein said osteoblast is located in a subject.
- 25 20. The method of claim 17, wherein said osteoblast is not located in a subject.

21. The method of claim 20, wherein said subject suffers from bone loss, bone damage, or bone destructive disease.
22. The method of claim 21, wherein said bone destructive disease is osteoporosis, secondary osteoporosis, osteolytic bone cancer, Paget's Disease, endocrinological disorders, hypophosphatemia, hypocalcemia, renal osteodystrophy, hypoparathyroidism, hyperparathyroidism, or osteomalacia.
23. The method of claim 16, further comprising contacting said osteoblast with an additional osteogenic factor.
24. A method of separating an osteoblast inducing factor from metastatic prostate cancer cell conditioned medium comprising:
 - (a) obtaining metastatic prostate cancer cell conditioned medium;
 - (b) fractionating components of metastatic prostate cancer cell conditioned medium; and
 - (c) assaying for osteoblast inducing activity in fractions from (b),wherein a fraction possessing osteoblast inducing activity contains separated osteoblast inducing factor.
25. A method of separating a bone inducing factor from metastatic prostate cancer cell conditioned medium comprising:
 - (a) obtaining metastatic prostate cancer cell conditioned medium;
 - (b) fractionating components of metastatic prostate cancer cell conditioned medium; and
 - (c) assaying for bone inducing activity in fractions from (b),wherein a fraction possessing bone inducing activity contains separated bone inducing factor.
26. A method of identifying an osteoblast inducing factor from metastatic prostate cancer cell conditioned medium comprising:

- (a) obtaining metastatic prostate cancer cell conditioned medium;
- (b) fractionating components of metastatic prostate cancer cell conditioned medium;
- (c) assaying for osteoblast inducing activity in fractions from (b); and
- (d) identifying the factor in the fraction of (c).

5 27. A method of identifying a bone inducing factor from metastatic prostate cancer cell conditioned medium comprising:

- (a) obtaining metastatic prostate cancer cell conditioned medium;
- (b) fractionating components of metastatic prostate cancer cell conditioned medium;
- (c) assaying for bone inducing activity in fractions from (b); and
- (d) identifying the factor in the fraction of (c).

28. Polyclonal antisera against metastatic prostate cancer cell conditioned medium.

29. A method of preparing an antibody population comprising:

- (a) generating polyclonal antisera against metastatic prostate cancer cell conditioned medium; and
- (b) depleting said antisera of antibodies reactive with non-metastatic prostate cancer cell conditioned medium.

30. A method of preparing a hybridoma cell comprising:

- (a) generating a hybridoma cell population secreting antibodies against metastatic prostate cancer cell conditioned medium; and
- (b) depleting said hybridoma cell population of cells secreting antibodies reactive with non-metastatic prostate cancer cell conditioned medium.